

REMARKS

Claims 1-10 were pending. Claims 7-10 have been withdrawn. Claims 1 and 4 have been amended for clarity. Dependent claim 11 has been added. Claims 1-11 presently are pending.

Acknowledgement of Applicants' Information Disclosure Statement filed on February 22, 2002 with the application respectfully is requested.

The drawings have been objected to on the basis that they fail to show the conventional names for elements shown in the Figures using non-conventional symbols. The attached Replacement Sheets address all of the Examiner's concerns. The application as amended should be in proper form.

Claims 1-3 stand rejected under 35 U.S.C. § 112, second paragraph, on the basis of indefiniteness. Claim 1 has been amended to delete the phrase "or potential converting" in response to the Examiner's concerns. The claims are submitted as particularly pointing out and distinctly claiming the subject matter of the invention.

Claims 1-5 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 5,998,969 to Tsuji et al. Applicants respectfully traverse this rejection.

The present invention as recited in amended claim 1 is a battery apparatus that includes plural battery modules connected in series, each having plural battery cells connected in series, and plural low order control devices which are provided in correspondence with the plural battery modules, respectively. Each of the plural low order control devices controls the plural battery cells corresponding to one of the plural battery modules. The plural low order control devices include a low order control device at a highest potential among the plural low order control devices, a low order device at a lowest potential among the plural low order control devices, and at least one low order device at a potential between the highest potential and the lowest potential among the plural low order control devices. A high order control device controls the plural low order control

devices. Isolating units connect an input terminal of the low order control device at a highest potential among the plural low order control devices to the high order control device, and an output terminal of the low order control device at a lowest potential among the plural low order control devices to the high order control device. Interruption elements are disposed between the output terminal of a corresponding one of the plural low order control devices and the battery cell in a corresponding one of the plural battery modules on a low potential side and blocks discharge current of the battery cells in the corresponding battery module. Terminals related to input and output of a signal are connected in an electrically non-isolated state among the plural low order control devices. The terminals related to input and output of a signal for the at least one low order device at a potential between the highest potential and the lowest potential among the plural low order control devices are connected only to others of the plural low order control devices.

Tsuji et al. discloses battery regulating circuitry in which each of the battery modules M1, M2, M3 is connected to a low order device CC1, CC2, CC3. All of the low order devices are connected to the high order battery controller BC. Thus, Tsuji et al. does not teach or suggest a battery apparatus in which isolating units connect an input terminal of the low order control device at a highest potential among the plural low order control devices to the high order control device, and an output terminal of the low order control device at a lowest potential among the plural low order control devices to the high order control device. In the Tsuji et al. system, the terminals related to input and output of a signal for the at least one low order device at a potential between the highest potential and the lowest potential among the plural low order control devices are connected only to others of the plural low order control devices (and not to the high order device). Claim 1, and its dependent claims 2, 3, and 11, are submitted to be patentable over the cited reference to Tsuji et al.

Independent method claim 4 has been amended to recite that the high order control device is connected to inputs of the low order control device at a highest potential among the low order control devices, and to outputs of the low order control device at a

lowest potential among the low order control devices. Inputs and outputs of the at least one low order control device at a potential between the highest and the lowest potential of the low order control devices are connected only to other low order control devices. As noted above in connection with amended claim 1, Tsuji et al. discloses an apparatus in which all of the low order control circuits are connected to the high order battery controller. Thus, Tsuji et al. does not anticipate or render obvious the present invention as recited in amended claim 4. Claim 4, and its dependent claims 5 and 6, are submitted to be patentable over the cited reference to Tsuji et al.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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Attachments